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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
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Additional Inventors are being named on the _____ *separately numbered sheets attached hereto*

TITLE OF THE INVENTION (500 characters max)

MOISTURE BARRIER WITH <<NO BUMP>> JOINTS AND METHOD OF INSTALLING SAME

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

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OR

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☑ Specification *Number of Pages* 12
☑ Drawing(s) *Number of Sheets* 4
☐ Application Data Sheet. See 37 CFR 1.76
☐ CD(s), Number _____
☑ Other (specify) POSTCARD

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

☑ Applicant claims small entity status. See 37 CFR 1.27.
☑ A check or money order is enclosed to cover the filing fees.
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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

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[Page 1 of 2]

Respectfully submitted,

SIGNATURE _____ Date 04-06-2004

TYPED or PRINTED NAME REJEAN PLANTE REGISTRATION NO. _____ *(if appropriate)*

TELEPHONE 514-376-1273 Docket Number: _____

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Provisional patent application of

Réjean Plante for

Moisture barrier with « no-bump » joints and method of installing same

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates generally to membranes but more particularly to moisture barrier underlayments for use in roofing, flooring and other related applications.

Background

The prior art reveals the use of moisture moisture barriers chiefly aimed at the roofing trade. A fundamental limitation in the way moisture barriers are installed requires a bump producing overlap of the joints. This limitiation is a major drawback in the use of such membranes in the flooring trade. Indeed, a floor surface cannot tolerate the presence of a bump underneath a floor surface since that bump transfers to the floor surface. Even for roofs the presence of bumps can become a problem since it is often required for workers to walk on roof surfaces such as when maintaining air conditioning units or other such pieces of equipment found on roofs. Walking across bumps or dragging and carrying equipment across bumps can damage the overlap and which can result in a leak.

The membrane currently used for roofing and which has already excellent properties which makes it a perfect choice for a variety of applications going beyond its original purpose. Currently such membrane consists of at least one layer of bitumen or related substance offering hydrophobic properties and coated on one or two faces by one or several films and is reinforced or not either at its core or surface.

In the flooring trade, there is no use of such hydrophobic membranes which are true moisture barriers, rather, moisture retarder membranes are used to help reduce problems related to expansion and contraction of floors using wood as its main component although moisture can also affect other types of flooring material such as ceramic tiles. Moisture retarding underlayment are, like the term implies, means for slowing down variations in moisture level. That is useful for short term fluctuations in moisture levels but in areas where moisture such as from an unheated basement is present at a high level for weeks or even months, this can cause serious warping on a wooden floor since, over time, moisture will pass through the moisture retarder and infiltrate the wood fibers. Another way by which moisture can infiltrate from underneath is when moisture is released by the concrete, such as in a basement, which raises the level of moisture.

Moisture coming from underneath is very dificult to control and thus far, the only practical solution appears to be moisture retarder which have the problem of having moisture leaks occuring at the joints between strips of the membrane that are not sealed but merely overlapped. To overcome this, some membranes use taped joints

but the tape can, over time, deteriorate and become useless, thus exposing opened joints.

SUMMARY OF THE INVENTION

It is therefore a main object of this invention to provide for a true moisture barrier membrane to help equalize moisture levels between the top and bottom layers of a floor surface.

It is another object of this invention to provide for a membrane having true sealing joint presenting no bump.

It is a final object of this invention to provide for a membrane having joints wherein the boundary between one strip and the next becomes indisguishable so as to provide a monolithic structure.

In order to do so, a new profile has to be invented which creates overlapping areas that do not increase the thickness of the membrane at the overlap, a so called « no-bump » joint. In other words, a number of variations are disclosed explaining various overlapping joints solutions.

The foregoing and other objects, features, and advantages of this invention will become more readily apparent from the following detailed description of a preferred embodiment with reference to the accompanying drawings, wherein the preferred

embodiment of the invention is shown and described, by way of examples. As will be realized, the invention is capable of other and different embodiments, and its several details are capable of modifications in various obvious respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1abc Perspective views of the membrane and its joint variations.

FIG. 1d Perspective view of a panel showing its soft edges.

FIGS. 2abcd Perspective views of additional joint variations.

FIGS. 3abc Perspective views of peel and stick layer on joint; of an overlap with a least one sticky surface; of a membrane having a coating, such as granular coating.

FIG. 4 Perspective view of various trims.

FIG. 5 Perspective view of a spacer tool.

FIG. 6 Perspective view of a gable roof showing variations of the underlayment, including surface top coating.

FIG. 7 Perspective view of a roll of membrane with the end of roll ruler.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A membrane (10) is laid on top of a subfloor (12). In the case of **FIG. 1a,** the subfloor (12) is concrete but it could be any type of material commonly used as subfloor material such as plywood, and is either the subfloor of a basement or the subfloor (12) of a multi storey concrete structure building. In both cases, concrete is known for

holding moisture over a long period of time and the problem is compounded when a slab of concrete is laid directly over a soil (14) that has a high water content. Since moisture content (MC) coming from underneath and through the subfloor can be, at times, much higher than the MC in the ambient air (16) above the subfloor (12), that is the ambient air (16) in a given room, it is wise to block the ingress of moisture from underneath with the use of an efficient moisture barrier. As explained earlier, current membranes used in the flooring industry are merely moisture retarders and are therefore of limited efficiency. The bituminous based material used in roofing membranes is highly hydrophobic. **FIG. 1c** shows a roof membranes (18), as used today. It has the inconvenience of having an overlapped joint (20) which creates a surface bump. Although that is generally acceptable in a roofing environment, when it comes to laying down a floor, any irregularities of the subfloor can be transferred to the floor, which is of course undesirable.

To overcome this limitation, a major modification is proposed to the standard roof membrane (18) which makes it usable as a floor membrane (10) as seen in **FIGS. 1ab** where the edges (22) of the membrane (10) are thinner so that when a second strip (26) of membrane is layed down next to a first strip (24), the overlap (28) is of equal thickness with the rest of the membrane (10), as opposed to an overlap of the prior art as seen in **Fig. 1c** . One of the many properties of the original roof membrane (18) which is also found in this floor membrane (10) is that when a certain pressure is applied to the overlap (28), such as when passing a roller, the two separate strips (24, 26) become fused to the point of becoming indistinguishable from each other so as to

create a single monolithic structure rather than an aggregate combination of joined strip.

This of course insures a perfect moisture-proof seal. The floor membrane (10) is preferably raised along the base of the walls of the room to block any moisture that could rise due to capillary action or through a sudden rise in the water table in the case of a basement installation.

Besides being overlapped, the edges (22) can also be abutted and covered with a ribbon (30) of preferably identical material to the floor membrane (10) in order to seal the joint (32). A number of membrane profiles can be created, the up-down profile (34) where one edge (22) is up while the other edge (22') is down or the up-up profile followed by a down-down profile (36'), which is nothing more than a reverse up-up profile (36) since the membrane (10) presents two opposite faces each one covered by a film (38) (only the top face shown) which can be but not necessarily of the peel and stick type. The membrane (10) can be adhered to the subfloor (12) if the film (38) is of the peel and stick type. Likewise, floor boards (40) can be adhered or not to the membrane (10) depending upon whether the film (38) is removed or not. To control the amount of adhesion desired, the film (38) has dotted perforations (42) so that only narrow, spaced apart strips can be removed. Usually floor boards (40) are nailed or stapled and when the nails (46) or the staples (48) pass through the membrane and into a wood subfloor (as opposed to concrete), the viscous properties of the membrane material make each puncture self sealing so that the moisture properties of the membrane (10) are not affected.

Figs. 2abcd Besides the variations above, other options include a down-down profile (36') which creates a groove (60) from where moisture or water can migrate and be eliminated through normal evaporation.

When installed on a concrete subfloor (12), the floor boards (40) can be nailed preferably in their center or otherwise mechanically fastened to an intermediate panel (44) set between the membrane (10) and the floor boards (40) and which can receive the nails (46) or the mechanical fasteners, usually staples (48). The panels (44) are narrow – about, but not limited to 2 to 16 inches in width so that preferably only one nail (46) or staple (48) is put into each panel (44) for example, if the manufacturer of the wood floor recommends nailing or stapling at every 9 inches, a 9 inch panel (44) is preferably selected if it is 5 inches, a 5 inch panel (44) is selected. By having only one nail (46) or staple (48), the panel (44) is free to expand and contract within the spacing (50) set between each panel (44) which reduces stress on the floor boards (40). The spacing (50) is selected according to factors such as the type of material the panel (44) is made of and a typical moisture content and fluctuation for the geographical area the panel (44) is to be installed and is measured using a spacer tool (500) as per **FIG. 5** having a plurality of radially expanding strips (502) of various thicknesses indicated by indicias (not shown) and color coded on each strip (502) to select the proper spacing (50) between each panel (44) . The panels (44) are staggered during installation (**FIG. 1a**)so that the floor boards (40) do not hit all a series of aligned spacings (50) along a length of floor, and the the panels (44) are preferably installed cross side with the floorboards (40).

Each panel (44) has softened edges (**FIG. 1d**) on all faces so as to reduce potential damage to the membrane (10) during the installation process of the panels (44). Additionally, the membrane won't be damaged by repeated contraction and expansion of the panels (44) over the years.

FIG. 3a the film (38) covers a sticky edge (20). The joint is made thinner by applying pressure during the manufacturing process so that the core layer (300) is also compressed and so is the coating or coatings (302) which are applied during manufacturing. The core layer (300) and coating (302) do not have to share 50/50 of the thickness depending upon the manufacturing process used, the ratio can vary as well as the num,ber of layer, some membranes (10) have a top silicon layer (304) as per **FIG. 3b** while others have aggregates (306) as per **FIGS. 3 ac**.

FIG. 4 When laying the membrane (10) and reaching corners, folding of the membrane (10) can provide adequate sealing for inside corners but for outside corners and around doorways or passageway or columns special corner modules having hydrophobic properties are used to provide adequate sealing properties. The corner modules are identified as : inside corners (400); outside corners (402); passageway corners (404); as well as a linear trim (406) which is used when it is otherwise impractical to raise the membrane up the wall as per **FIG. 1**

Besides its moisture repellent properties, the membrane (10) also has soundproofing characteristics, great resistance to any mishaps such as dropped tools and other such

incidents common in a construction environment which would normally puncture the less resistant polyethylene membranes used today. Also, after the floor boards (40) are laid, any dropped object will be less likely to break since there will be a cushioning effect from the membrane (10). For example, in a gym environment, a falling athelete will likely be less hurt since the floor will absorb part of the impact. In any case, sound transmission is greatly reduced by the soundproofing characteristics of the membrane (10). Of course if more sound prooofing is desired any other type of membrane or soundproofing system can be installed on top of the membrane (10).

FIG. 6 When used on a gable roof (600), the membrane (10) can be laid horizontally as is customary in the trade or it can be layed vertically as per this illustration wherein various types or overlaps (602) as described earlier are showcased and also can include surface top coatings which makes the membrane the only roof covering necessary; followed by the overlap of **FIG. 2d** which creates a groove (60) from where moisture or water can evacuate down the slope. The membrane (10) goes over the apex of the roof (604) and down to the other side so that there are no seams at the apex. (604). Typical shingles (606) can then be laid. For flat roofs, an installation similar to a floor installation is made with no bumps. Multiple layers of membranes (10) can be laid one on top of the other without creating any bumps or seams.

FIG. 7 A roll of membrane (10) can have as a feature an end of roll ruler (700) which clearly indicates the length of roll left so that a tradesman can better evaluate what to do with the rest of the membrane (10).

A way of defining the membrane (10) is thusly: A monolithic membrane (10) consisting of at least one layer of bitumen or other such hydrophobic substance coated on one or two faces by one or several films (38) and or other material– reinforced or not, - offering or not peel-n-stick feature on either face for self-adhesive capability - and featuring or not zip strips, either on the full surface or on sections, wherein the membrane (10) is constructed with edges (20) of special shape, either on at least one side, which may be attached or not to the core layer (300) above, so that at least two superposed edges (20) of adjoining sections of membrane (10) can be knitted together easily by sensible pressure, action of flame or otherwise, the sections of membrane (10) so knitted forming a monolithic surface having waterproof, air/vapor proof and moisture barrier capabilities and on reguest fire retardant, without concern for the thickness, the width, the angle or the shape of either the edges (20) or the membrane (10) and without concern for any heatproof, soundproof, impact proof isolation or filling material added to the membrane (10) during manufacturing or installation, the monolithic surface formed thereafter offering a substantially flat and even surface ideal for use in support of floor, wall, ceilings et roofs application, wherein the surface features no bumps or knob preventing a normal use. Other indoor or outdoor applications of the membrane (10) cover notably top roofing layers, foundations, driveways, sidewalks, fire protections.

CLAIMS

1. A moisture barrier membrane comprising :

a membrane having hydrophobic properties and having edges thinner so that when a second strip of said membrane is layed next to a first strip, a sealing overlap of equal thickness with the rest of said floor membrane is created;

said edges of each said strip being in an up-down or up-up or down-down configuration.

2. A moisture barrier as in claim 1 wherein:

said edge being on at least one side of said membrane;

when two down edges abutt, they can be sealed with a ribbon;

said membrane further comprised of two opposite faces with at least one but preferably two faces covered by a film, which can be but not necessarily of the peel and stick type ;

said film being which can be but not necessarily removable in strips along dotted lines;

said down-down profile creating a groove from where moisture or water can evacuate.

3. A moisture barrier membrane as in claims 1 and 2 wherein subfloor panels are used to receive mechanical fasteners when said membrane is laid over concrete or other such hard surfaces and further comprising:

panels having a width from but not limited to 2 to 16 inches to correspond to the distance recommended by manufacturers for inserting mechanical fasteners;

said panels having set distances between them to allow for contraction and expansion.

4. A spacer tool for use in spacing panels comprising:

a plurality of radially expanding strips of various thicknesses to select the proper spacing between each panel, and wherein each said strip has indicias and is color coded.

5. Corner and linear trim for use with a membrane of claims 1 and 2 wherein;

hydrophobic inside corner;

hydrophobic outside corner;

hydrophobic passageway corner;

hydrophobic linear trim;

each said corner and trim providing sealing properties for said membrane.

6. A subfloor made out of panels having softened edges and being spaced apart by a spacing according to factors such as the type of material said panel is made of and a typical moisture content and fluctuation for the geographical area said panel.

7. A subfloor as in claim 6 wherein:

said spacing being measured using a spacer tool.

FIG. 1

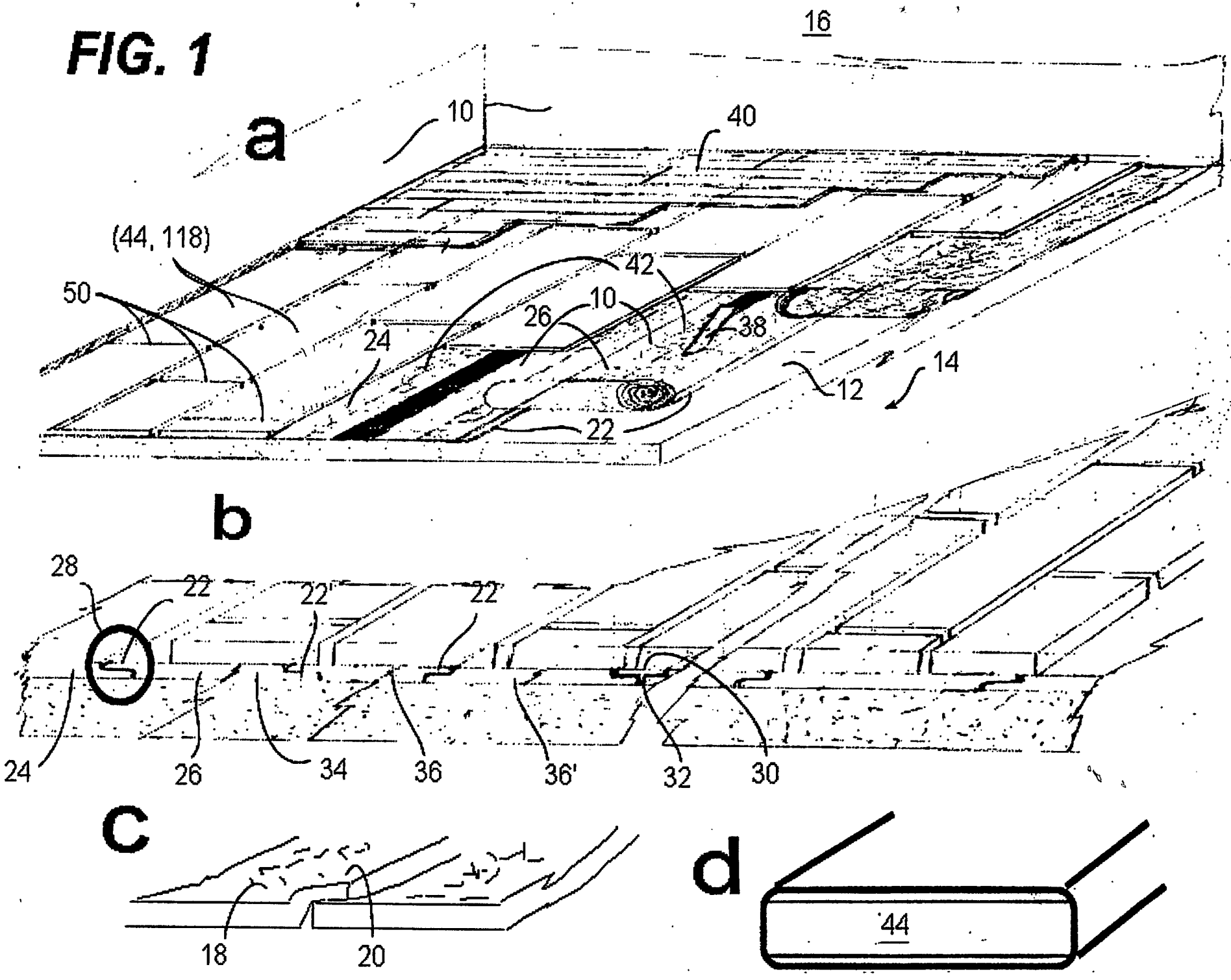

FIG. 2

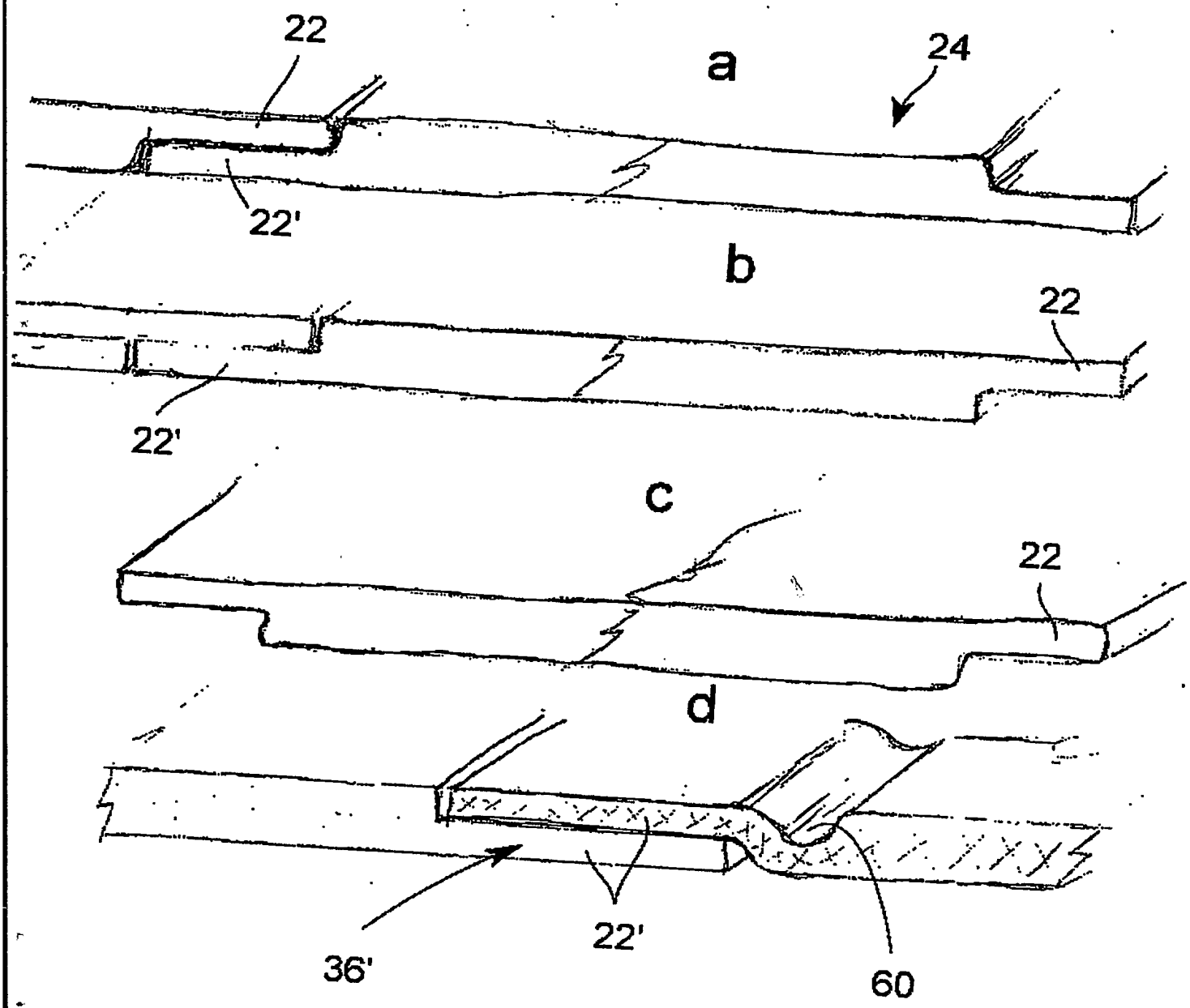

FIG. 3

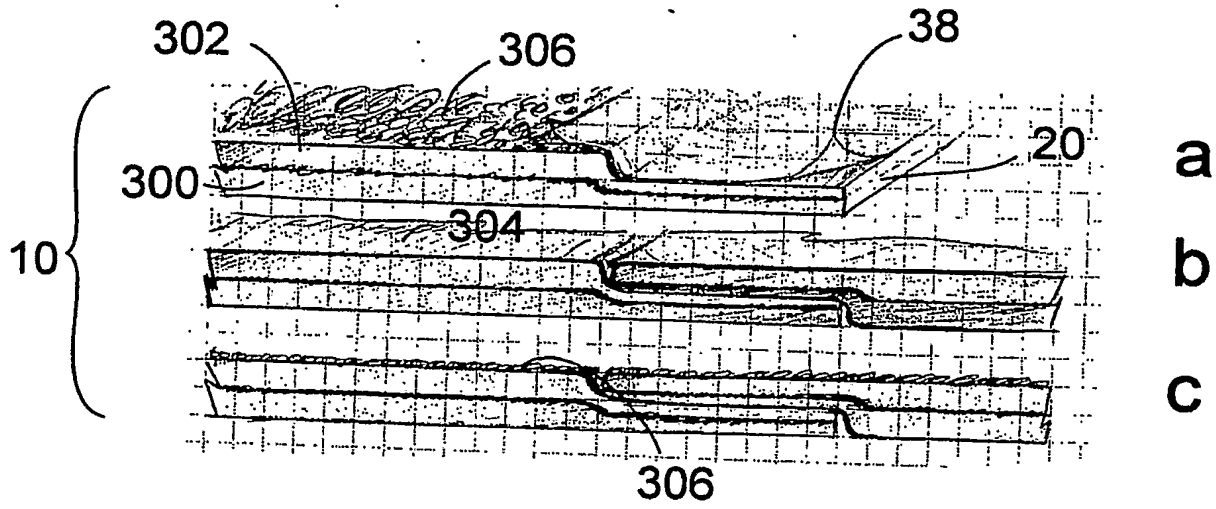

FIG. 6

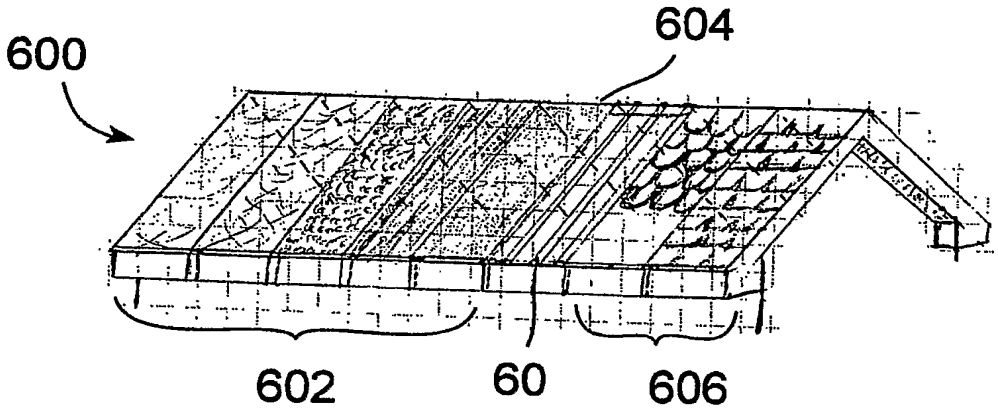

FIG. 7

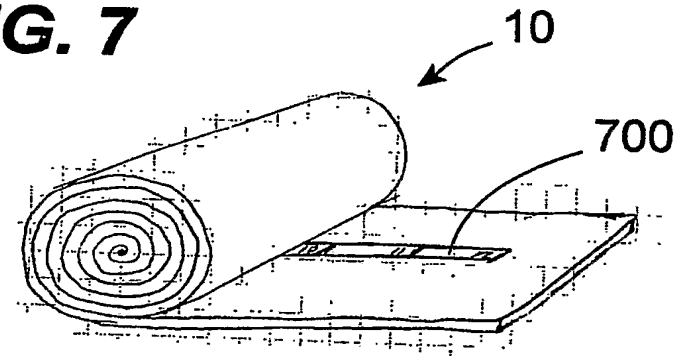

FIG. 4

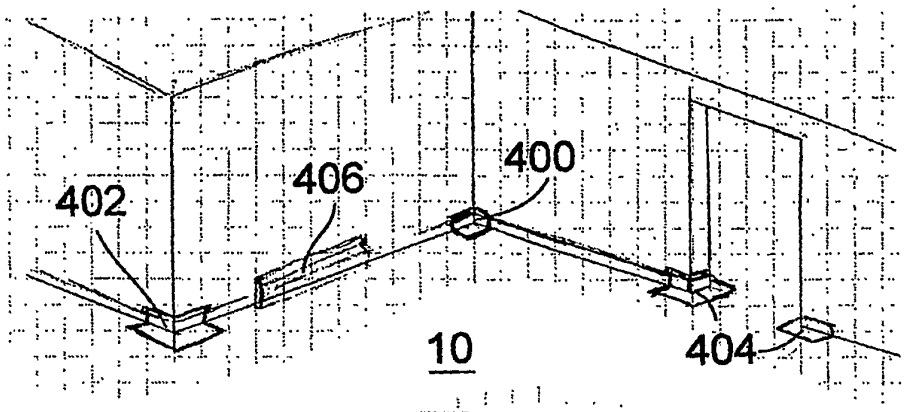

FIG. 5